RETMA MEMBER

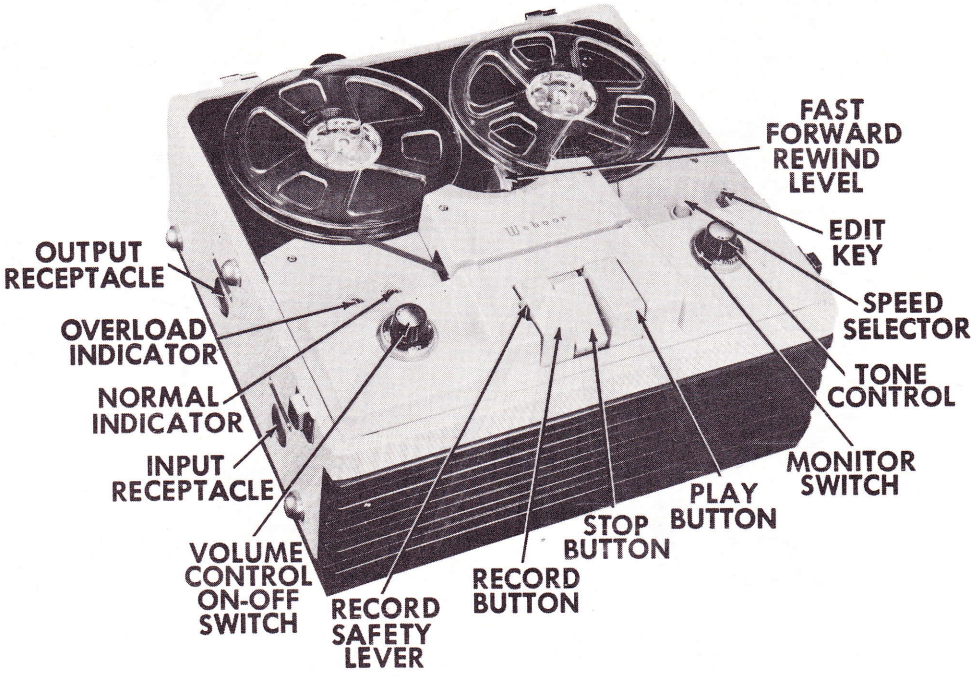

Figure 1

GENERAL INFORMATION

The Webcor 2020 Series Tape Recorders are designed for twin-track, two speed operation. The operating speeds are either 3 3/4 or 7 1/2 inches per second. The Webcor is designed to record and playback two tracks of material on standard width recording tape, which doubles the recording and playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone.

The Webcor 2020 Series are mechanically and electrically alike. The only difference being in the cabinet, or carrying case used. The portable model of this series, 2020, is available in Ebony (E-2020) or in Tan (T-2020). The table models are available in Walnut (2021), Mahogany (2022), Blonde (2023) or Beige (2024).

Webcor 2020 Series have two tape speeds, 7 1/2" and 3 3/4" per second. Using both tracks, the recording times are as follows:

Size Reel	Speed	Speed
	3-3/4"	7-1/2"
5"	1 hour	1/2 hour
7"	2 hours	1 hour

The 2020 Series are designed to operate on 60 cycle, 105-120 volts, AC supply only.

Manufactured by:

Webcor
5610 Bloomingdale Ave.
Chicago 39, Illinois

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WEBCOR MODELS E-2020, T-2020, 2021, 2022, 2023, 2024

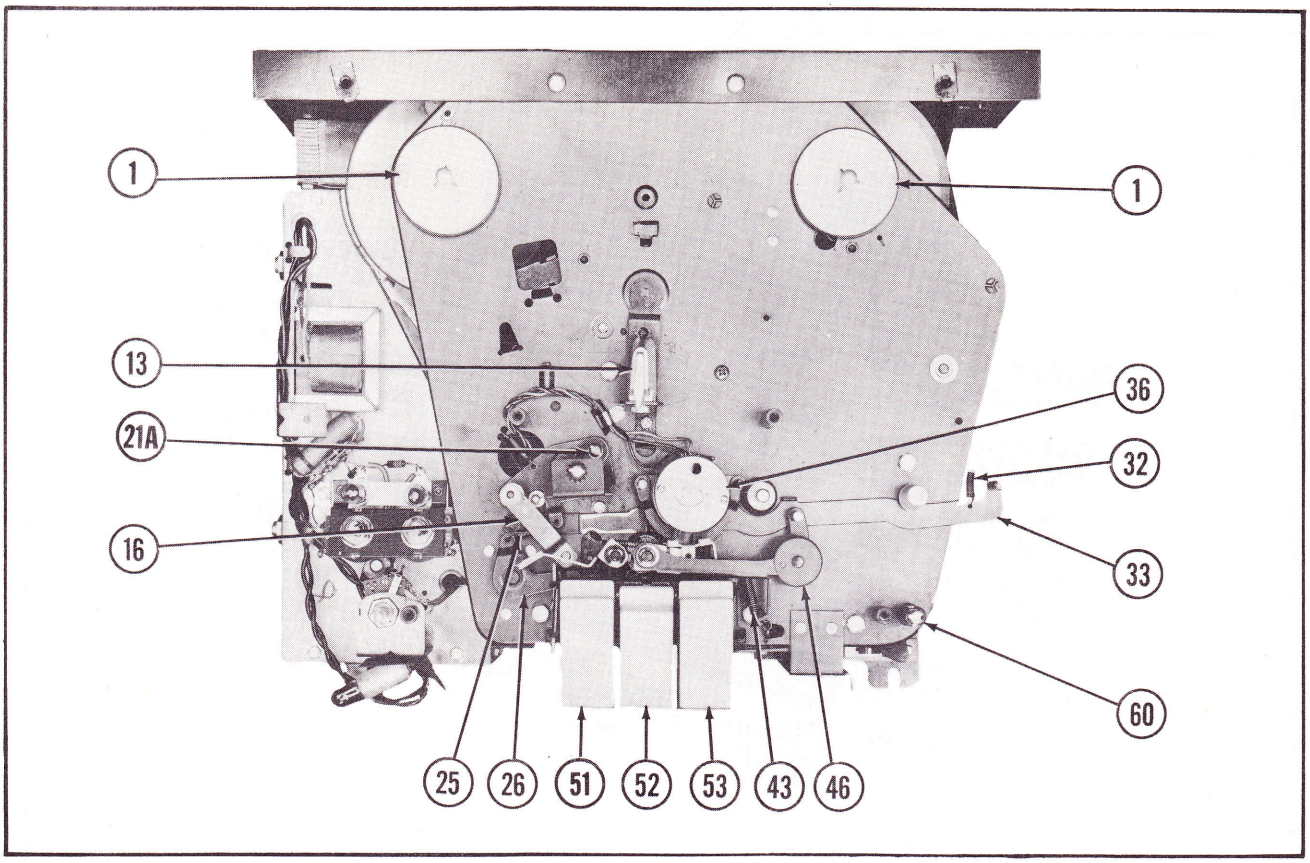


Figure 2

FUNCTIONS OF THE CONTROLS

On-Off-Volume Control-

1. Turning this control clockwise a quarter of a turn you apply operating voltage to the recorder.

2. The tube filaments and the pilot indicator lamp should light.

3. Additional clockwise rotation will increase the signal strength.

Tone-Monitor Control-

1. The top knob is the tone control. Turning it clockwise accentuates bass during playback only.

2. The bottom knob is the monitor switch. Turning the knob clockwise turns the monitor on during recording. Turning the knob counterclockwise disconnects the monitor during recording.

Record Button-

1. Release the safety lock lever (54) before pressing "Record Button".

2. Pressing the "Record Button" (51) actuates pressure roller (46) against capstan shaft (12).

3. Relieves brake drag (148).

4. Brings erase magnet and its pressure pad (28) against opposite sides of the tape.

5. Locks rewind lever (13) in the center position.

Play Button-

1. Pressing "Play Button" causes the same action described in items 1 through 5 under "Record Button".

2. The erase magnet pressure pad engages the tape, the erase magnet is not brought into contact with the tape.

3. Switching action occurs which feeds the signal picked up by the recording head through a series of amplifiers.

Stop Button-

1. Pressing the "Stop Button" releases the pressure roller.

2. Releases the recording head pads from their position against the recording head.

3. Releases the motor bushing from its position against the capstan rim.

4. Releases the erase magnet and its pressure pad from against the capstan rim.

Speed Selector-

1. Pressing down on this button raises the capstan shaft to engage the roller for 7 1/2 I. P. S. operation.

2. Turning the button slightly to the left and permitting it to rise, will lower the capstan shaft to engage the pressure roller for 3-3/4 I. P. S. operation.

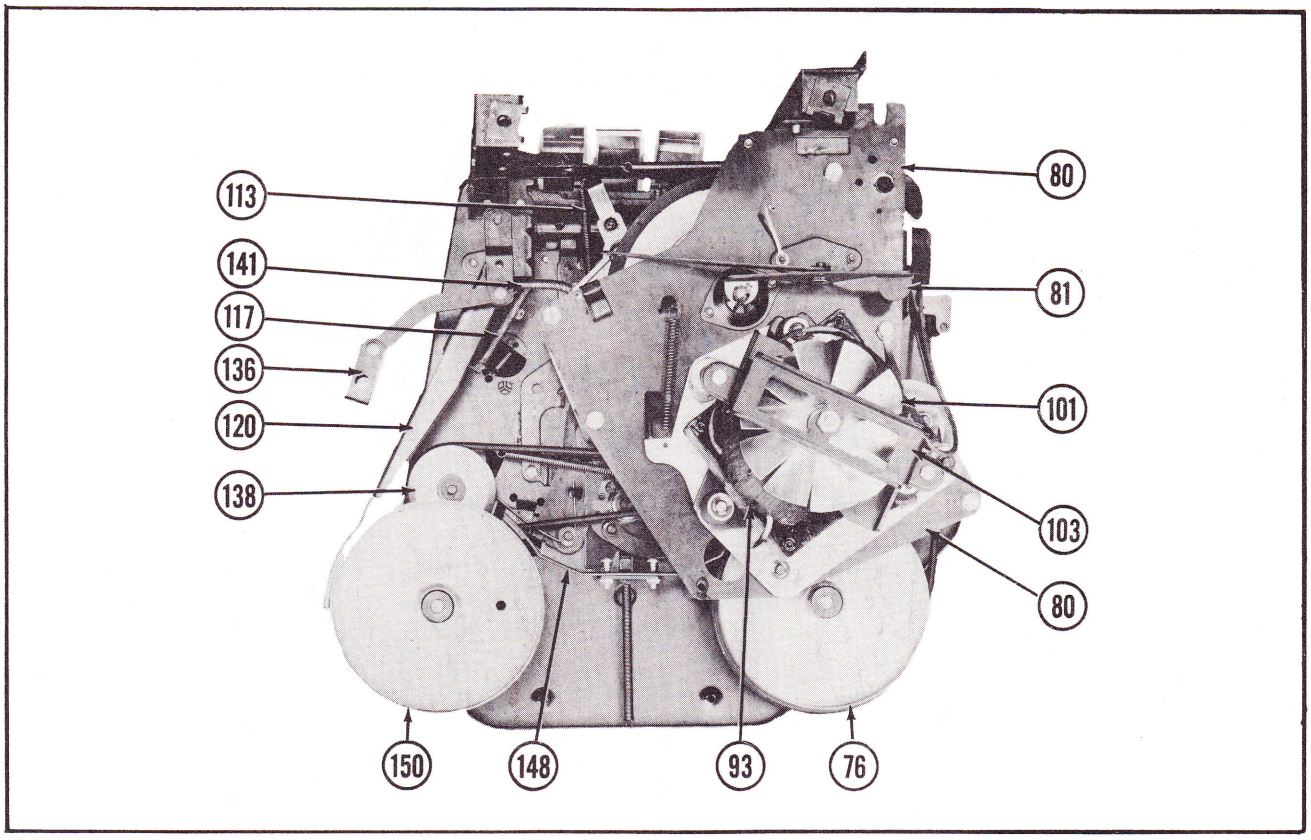


Figure 3

Edit Key-

1. Pulling forward on this lever will release the pressure roller from the capstan shaft.

2. The motor is not disengaged from the capstan shaft when the edit key is actuated nor does any electrical switching take place.

Fast-Rewind-Forward Lever-

1. When the stop button is depressed, the fast "Rewind-Forward" lever may be moved from its position, either to the left or right.

2. When the lever is moved to the right the belt engages the drum of the take up reel causing an approximate 20-1 ratio transport.

3. Moving the lever to the left causes a similar action on the supply reel.

OPERATING INSTRUCTIONS

Preparing The Webcor For Recording-

1. Plug the AC cord into a convenient wall receptacle of the proper rating.

2. Place the reel containing the tape on the left or supply spindle.

3. Place an empty reel on the right or "take-up" spindle.

4. Unwind about 12 to 15 inches of tape and guide it into the tape slot. (Be sure the shiny side of the tape faces the front of the cabinet).

5. Take the end of the tape and wrap it around the hub of the empty reel. Bring the end of the tape through one of the slots on the reel hub and revolve the reel several times.

To Make A Recording-

1. After the recording tape has been properly threaded, turn the "On-Off" switch and "Volume Control" to the "On" position.

2. Press the "Speed Selector" knob (9) down for 7-1/2 I. P. S. operation or turn slightly to the left and permit the button to raise for 3-3/4 I. P. S.

3. To record, pull the "Record Safety Lever" (54) downward, and at the same time push down firmly on the "Record" button.

4. Adjust the "Volume" control so that the "Overload Indicator" barely lights on the recording peaks and so that the "Normal Indicator" blinks constantly during recording.

To Record From Microphone-

1. Insert the microphone plug into the "Input Receptacle" located on the left side panel.

2. Follow the instructions under the heading of "To Make A Recording".

3. Best results will be obtained if the microphone is kept closer to the source of sound than to any walls in the recording area to prevent echos of the sounds as they rebound off the walls.

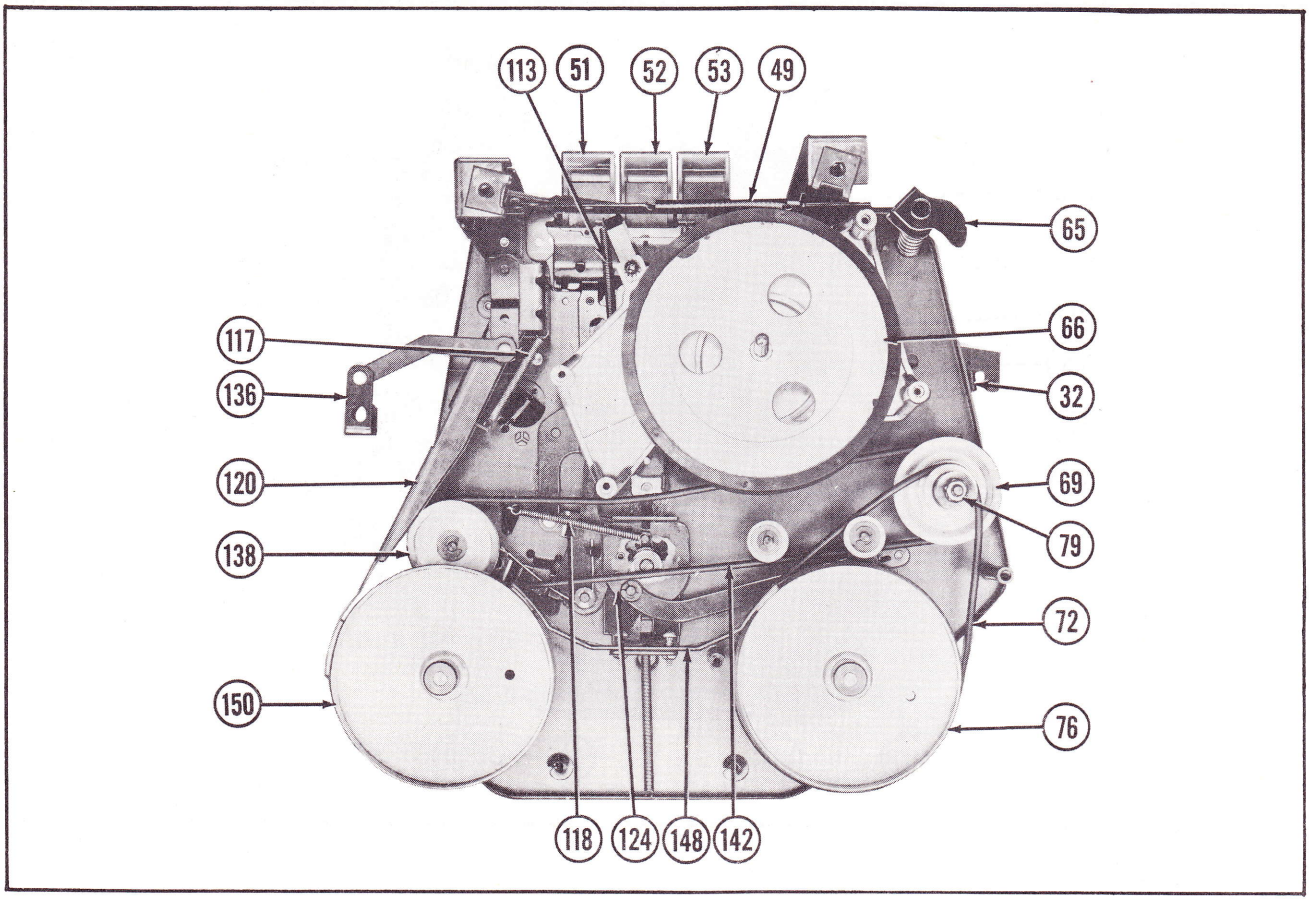


Figure 4

NOTE: The microphone should be kept at least three feet away from the loudspeaker during recording.

To Record From Radio Or Television Receiver-

Recordings can be made from a radio or television receiver by placing the microphone near the loudspeaker; however, this type of recording may not be satisfactory as other sounds may be recorded on the tape. A superior quality recording can be made by use of Radio Cord Attachment (part No. 2927). Connect attachment cord as follows:

1. Connect the cord clips across the voice coil terminals on the radio or television speaker.

2. Insert the cord plug into the "Input Receptacle" located on the left side panel of the recorder.

3. Set the radio or television receiver for soft playing then operate the Webcor controls as described under "To Make A Recording".

To Record From Phonograph-

1. Connect the alligator clips of the Radio Cord Attachment to the ends of the pickup leads of the phonograph and then insert the cord plug into the "Input Receptacle". Proceed with the recording as described under "To Make A Recording".

NOTE: Should a hum develop from the above connections, reverse the cord clips on the pickup leads.

To Rewind-

When the stop button is depressed, the "Fast-Rewind-Forward" lever (13) may be moved from its center position. To "Rewind" move the lever to the left. When the rewinding is completed move the mechanism control knob (52) into "Stop" position and allow the tape to come to a complete stop before moving the mechanism control knob to any other function.

Twin Track Operation-

Webcor 2020 Series are twin-track units, which record on approximately half the width of the tape at one time.

1. To record a second program on the same tape, lift the full reel from the right hand spindle, turn it over, and place it on the left hand spindle.

2. Place the empty reel on the right hand spindle; properly thread the tape, and continue your recording as described under "To Make A Recording".

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

To Play A Recording-

1. With the tape properly threaded, turn the mechanism control knob (51) to the "Play" position.

2. Adjust the "Volume" and "Tone" controls to suit.

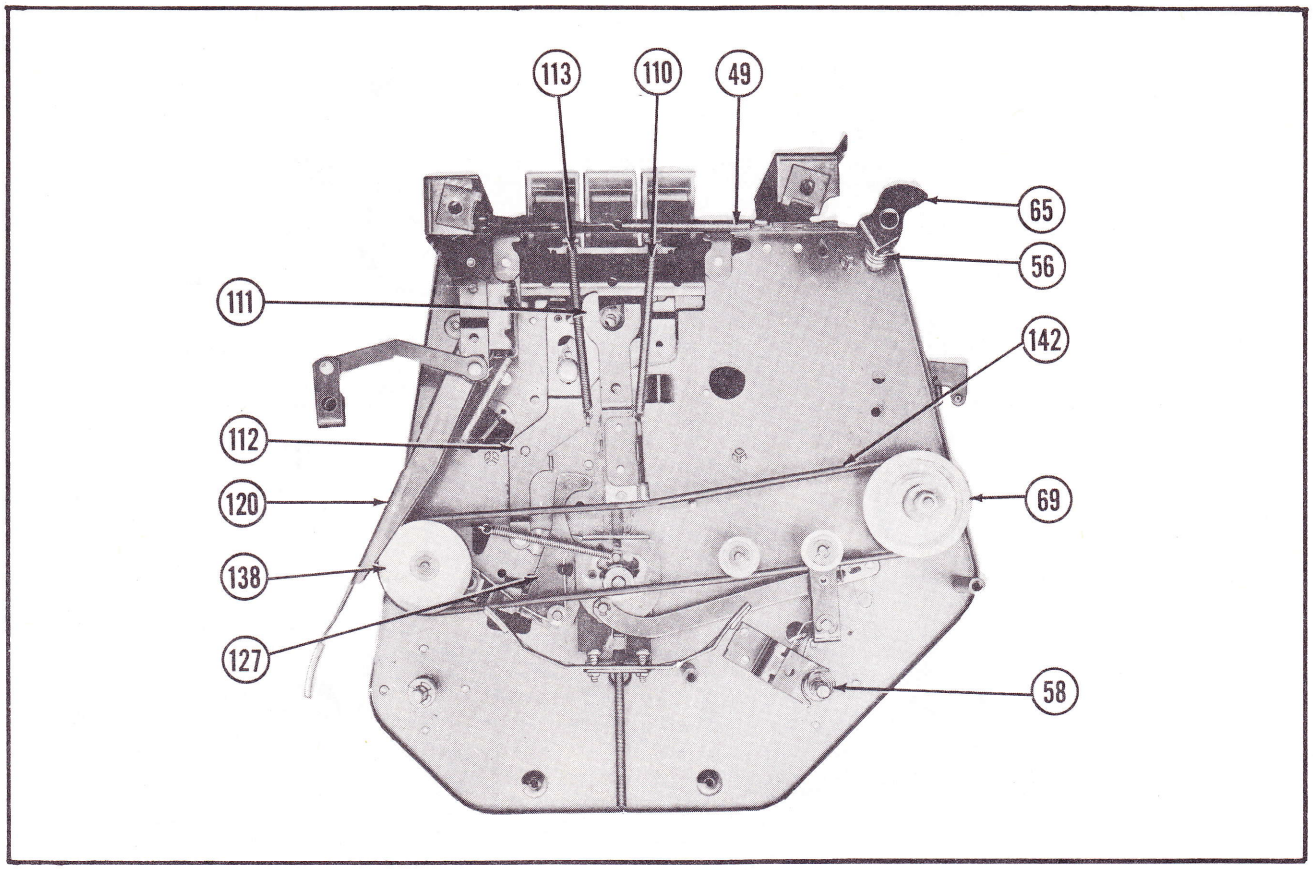


Figure 5

3. Be sure the "Speed Selector", located on the right side of the top panel, is in the speed that the recording was made.

Fast Forward-

If it is desired to reach a recording near the end of a tape in a few seconds, turn mechanism control knob (13) to the "Fast-Forward" position. For the "Fast-Forward" position the control should be turned to the right. When the lever is moved to the right you have approximately 20-1 ratio transport.

ADJUSTMENTS

Clutch Adjustments-

The nut (79) permits adjustment of the corresponding clutch assembly. It should be adjusted so that the take up reel absorbs the slack tape during the record and play operations. The clutch pad (70) is 10% oil saturated to permit a smooth take up and slipping action when constant tension of the tape is attained. Excessive tension may cause waver and tape squeal. Insufficient tension may cause tape looping ahead of the take-up reel, and a jerking action.

Erase Adjustment-

1. Insert a reel of recorded tape and press the "Record" button.

2. Check to see if the surface of the tape makes good contact with the surface of the shoe face. If it does not, adjust screw (21A).

3. Check to see that the top of the tape is exactly positioned at the top of the scribed diagonal line on the shoe face. If it is not, adjust the threaded tape guide (15) and the locking nut (14).

4. Turn the recorder "On".

5. Turn the volume control to minimum (full counterclockwise).

6. Play the reel of tape through with the recorder in the "Record" position.

7. Press the "Stop" button and rewind the tape.

8. Turn the volume control to maximum (full clockwise).

9. Set the recorder to the "Play" position. If the adjustments are correct, nothing should be heard as the tape is played back. No audio output indicates proper erase.

Play/Record Head Adjustment-

It is very important that play-record head (36) be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result.

IMPORTANT: The head has been aligned and locked in place at time of manufacture and should require no further adjustment, unless it becomes necessary to install a new head.

To adjust, make a tape recording of a 6000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 6000

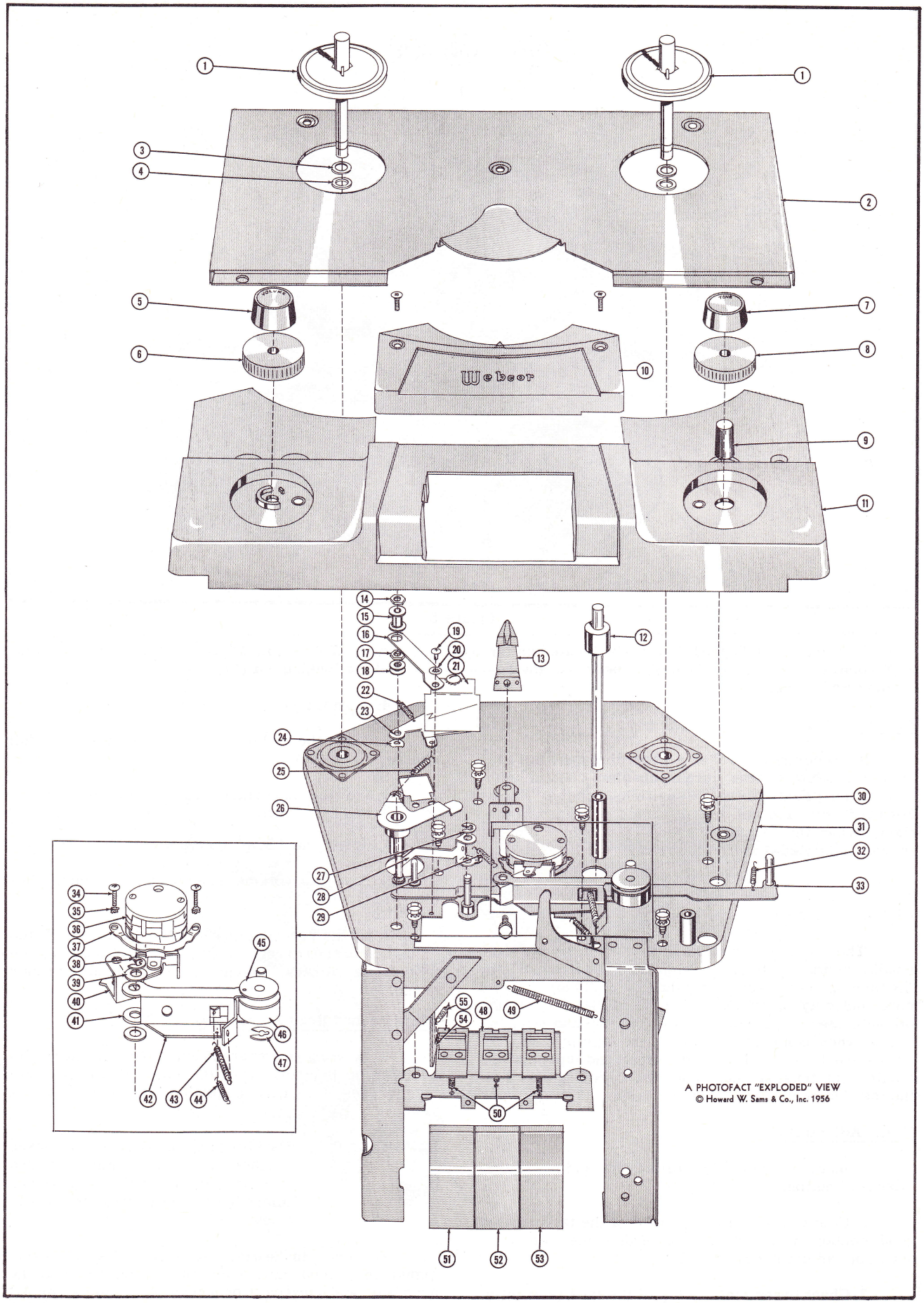


Figure 6A Exploded View of Parts Above Baseplate

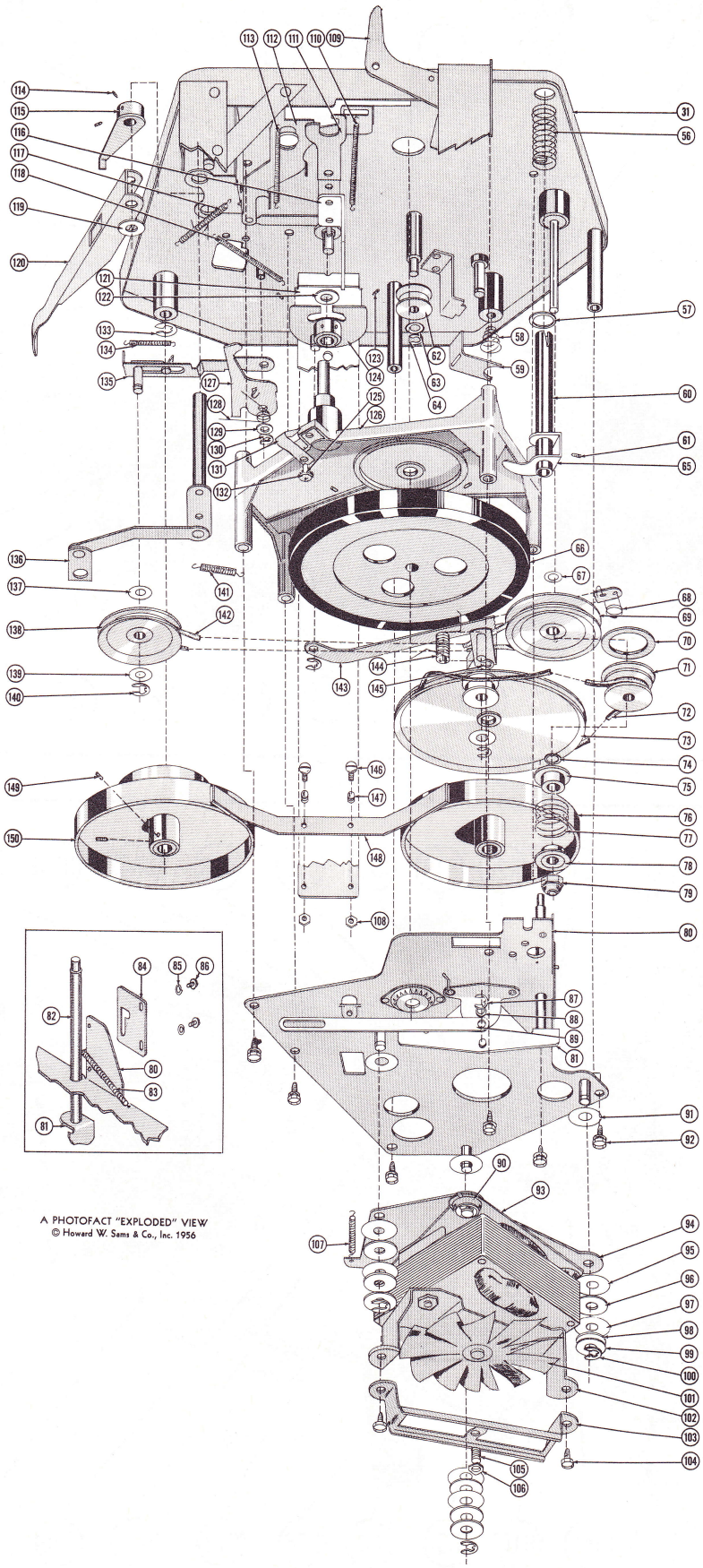


Figure 6B Exploded View of Parts Below Baseplate

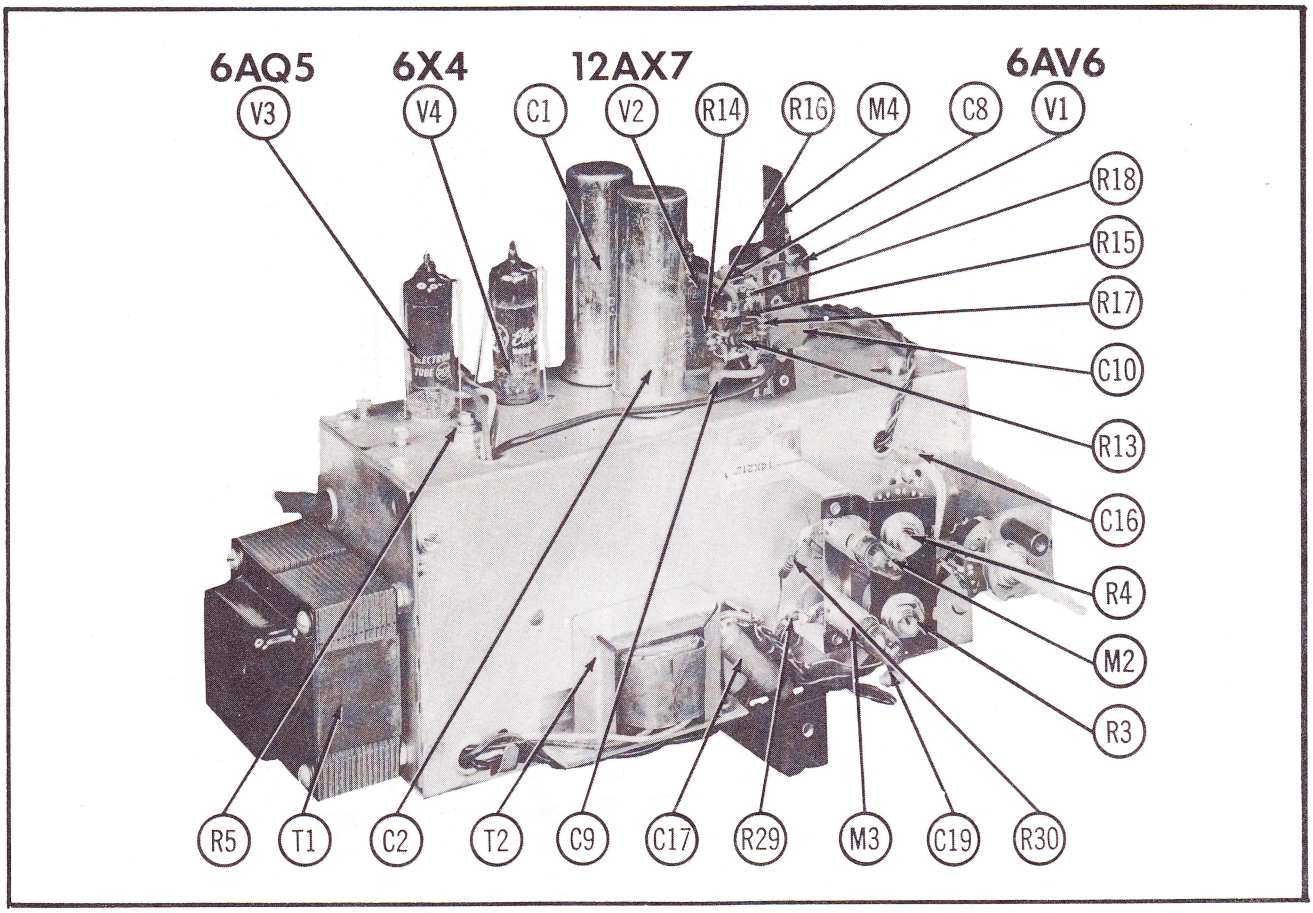


Figure 7

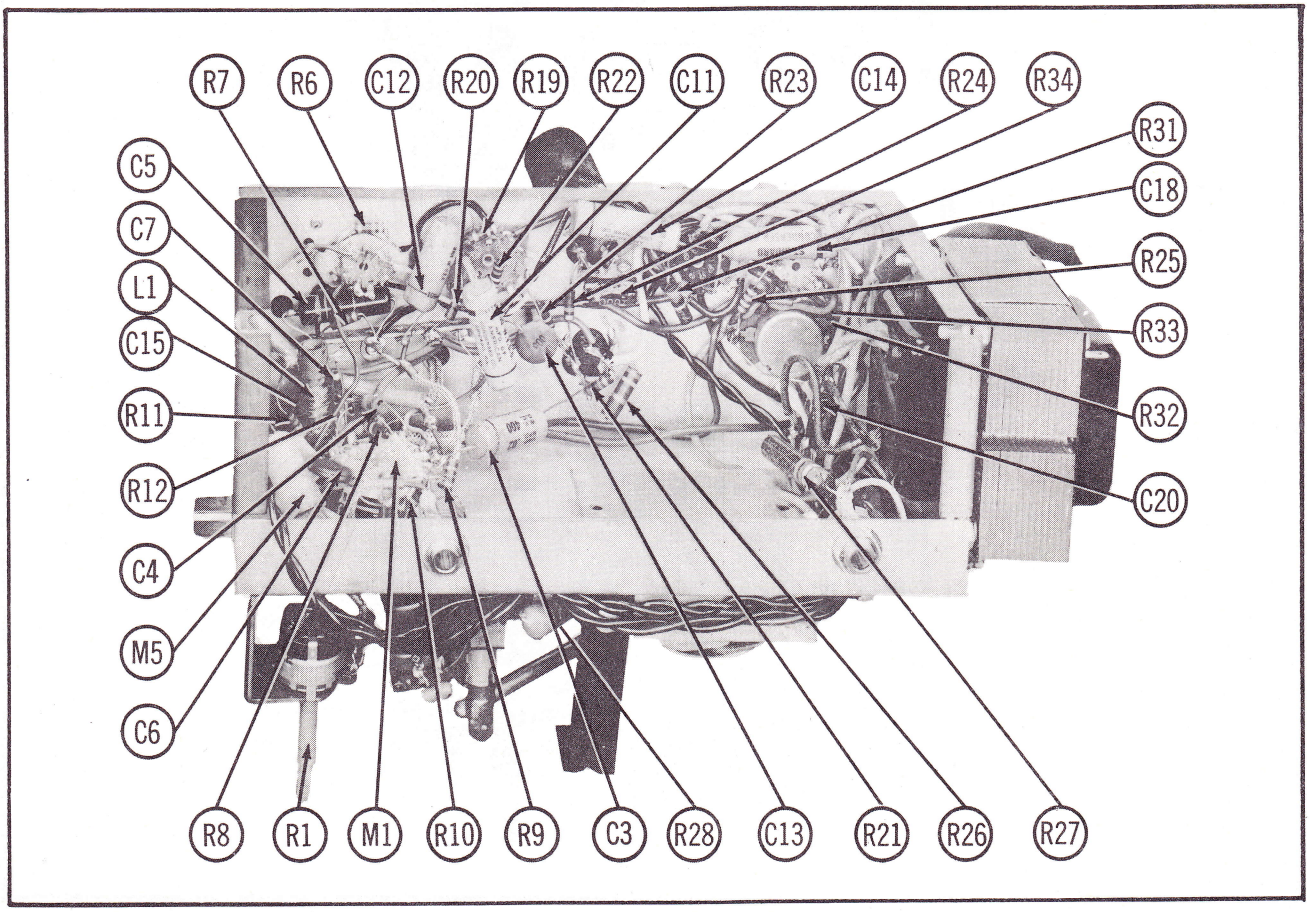
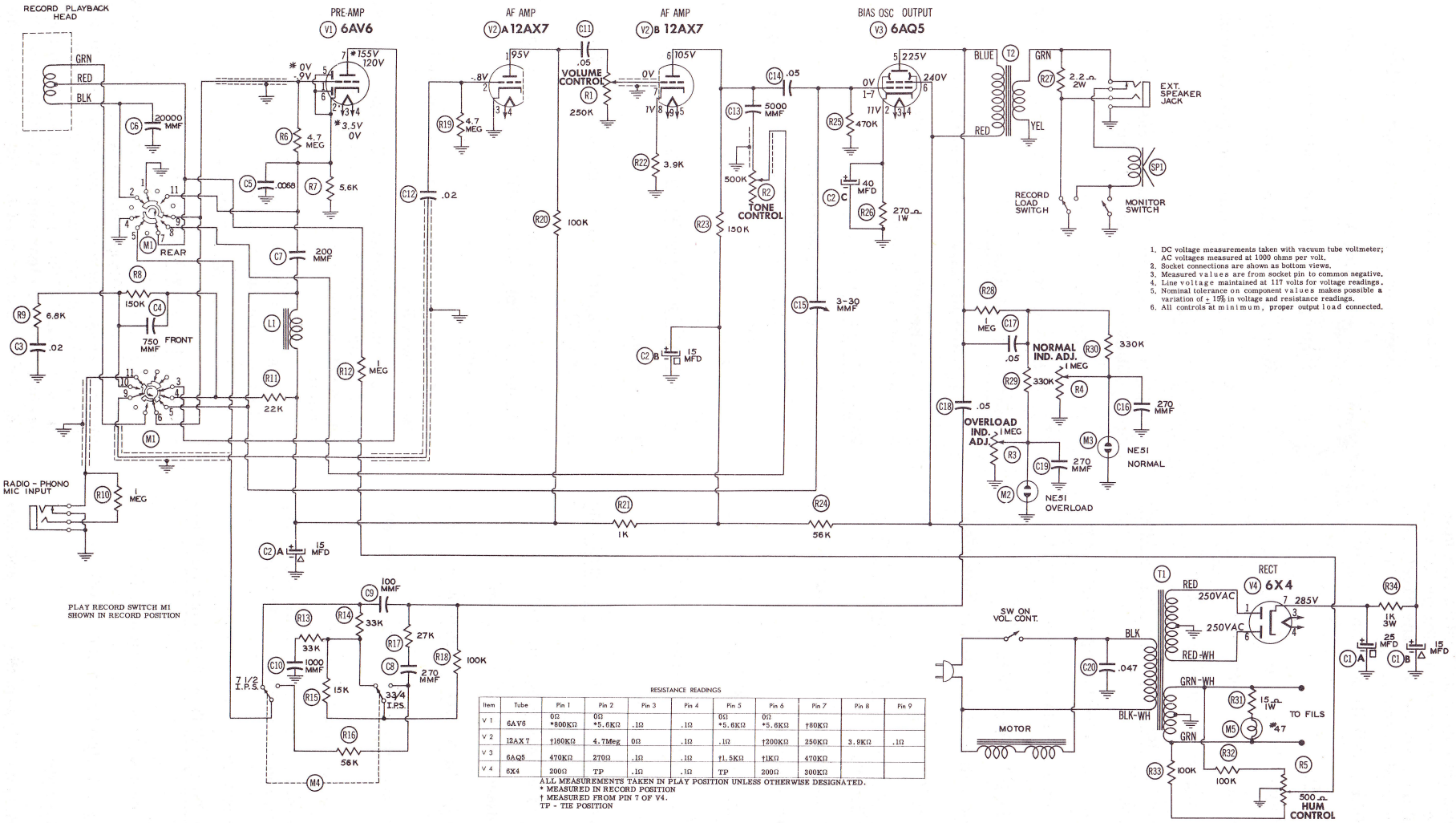


Figure 8



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AV6	0Ω *800KΩ	0Ω *5.6KΩ	.1Ω	.1Ω	0Ω *5.6KΩ	0Ω *5.6KΩ	†80KΩ		
V 2	12AX7	†160KΩ	4.7Meg	0Ω	.1Ω	.1Ω	†200KΩ	250KΩ	3.9KΩ	.1Ω
V 3	6AQ5	470KΩ	270Ω	.1Ω	.1Ω	†1.5KΩ	†1KΩ	470KΩ		
V 4	6X4	200Ω	TP	.1Ω	.1Ω	TP	200Ω	300KΩ		

ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN RECORD POSITION
† MEASURED FROM PIN 7 OF V4.
TP - TIE POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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WEBCOR MODELS E-2020, T-2020, 2021, 2022, 2023, 2024

cycle tape, rock play-record head (36) back and forth, loosening two screws (34) alternately until a maximum reading is obtained on the output meter or AC voltmeter. This adjustment should be made carefully to avoid damage to the head mechanism.

TROUBLES AND REMEDIES

Motor Fails To Operate-

1. Motor defective electrically.

2. Bent or binding motor shaft.

3. Thrust bearing screw (105) too tight.

Capstan Shaft Fails To Rotate In "Play" And "Record", But Motor Operates-

1. Broken or disconnected spring (107).

2. Binding motor shaft plate assembly (94).

Push Buttons Fail To Remain Depressed-

1. Improper operation of push button lock plate.

2. Bent push button.

Erase And Record Pads Fail To Move Forward Properly In Play And Record-

1. Broken or disconnected tension spring (29).

2. Binding Pad Assembly (28 or 40).

Pressure Roller Fails To Engage Capstan Shaft In Play Or Record-

1. Broken or disconnected tension spring (44).

2. Binding roller assembly (41).

Record Safety Lever Fails To Return Forward And Lock Play Button-

1. Disconnected or broken spring (55).

2. Loose or misadjusted bell crank (26).

Take-Up Reel Fails To Rotate In Record Or Playback-

1. Brake pad assembly (148) improperly adjusted.

2. Loose or broken belts (72 or 142).

3. Clutch assembly (consisting of 69, 70, 71, 74, 75, 77, 78 and 79) improperly adjusted or faulty.

4. Binding or bent supply reel spindle (1).

Supply Reel Fails To Yield Tape In Record Or Playback-

1. Binding or bent supply reel spindle (1).

2. Improperly adjusted brake pads (148).

Failure To Fast Rewind-

1. Loose set screw (123) on pulley cam, and idler link assembly (124); faulty assembly.

2. Improperly adjusted brake pad assembly (148).

3. Broken or loose belt (142).

4. Broken or disconnected spring (128).

Poor Or No Recording And Playback Of Tape-

1. Improper recording head alignment.

2. Worn recording head pressure pad (40).

3. Broken or disconnected tension spring (29).

Failure To Erase-

1. Improper adjustment of erase magnet or tape guide (15) (See "Erase Adjustment").

2. Worn erase pad (28).

3. Broken or disconnected tension spring (25).

Monitor Fails To Operate-

1. Loose or misadjusted switch arm (65).

2. Broken or disconnected tension spring on right section of monitor switch.

Failure To Fast Forward-

1. Broken or loose belt (72).

2. Improper clutch action due to glazed or worn cork disc (76).

3. Faulty pulley, cam, and idler link assembly (124).

Operation Of Speed Control Does Not Change-

Tape Speed-

1. Binding action in raising lever and stud assembly (81 and 82).

2. Loose or misadjusted screw on raising lever and stud assembly (81 and 82).

Wow-Waver-

1. Worn or pitted rubber rim drive on the capstan flywheel (66).

2. A bent capstan shaft (12) can cause erratic speed. The surface of the shaft in contact with the tape must be kept free of oil, adhesive and iron oxide particles.

3. A worn, pitted, or dirty pressure roller (46) will cause poor tape transport.

MAINTENANCE

Cleaning The Play-Record Head-

The play-record head is subject to an accumulation of tape coating residue which is worn off the tape as it passes the head. This should be periodically removed since it may cause faint recordings and poor playback. Wipe off the record and head contact surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen the cloth slightly with carbon tetrachloride.

NOTE: Do not use a brush or excessive amount of solvent on the head surface.

Lubrication-

Extreme care should be taken when lubricating the mechanism. For satisfactory operation the instructions in this section should be followed:

1. Mechanical linkage should be lubricated lightly at points of friction with a high temperature grease of medium consistency (BRB No. 1 grease of approximately 300 consistency is used in the factory lubrication of this recorder).

2. The shafts of rotating parts, when replaced should be wiped clean with a lint-free cloth or paper and oiled lightly with a drop of two of No. 10 oil.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	53P045	6AV6, Pre. Amp.	R9	29M6822	Resistor, 6. 8K, 1/2 W.
V2	53P028	12AX7, A. F. Amp.	R10	29M1052	Resistor, 1Meg, 1/2 W.
V3	53P037	6AQ5, Bias Osc. -Output	R11	29M2232	Resistor, 22K, 1/2 W.
V4	53P025	6X4, Rectifier	R12	29M1052	Resistor, 1Meg, 1/2 W.
C1A	30P049	Elect. Cap., 25MFD@450V.	R13	29M3332	Resistor, 33K, 1/2 W.
C1B		Elect. Cap., 15MFD@350V.	R14	29M3332	Resistor, 33K, 1/2 W.
C2A	30P5050	Elect. Cap., 15MFD@250V.	R15	29M1506	Resistor, 15K, 1/2 W.
C2B		Elect. Cap., 15MFD@350V.	R16	29M5632	Resistor, 56K, 1/2 W.
C2C		Elect. Cap., 40MFD@25V.	R17	29M2732	Resistor, 27K, 1/2 W.
C3	30P052	Cap. Paper, .02MFD@400V.	R18	29M1042	Resistor, 100K, 1/2 W.
C4	30P198	Cap. Ceramic, 750MMF@500V.	R19	29M4752	Resistor, 4. 7Meg, 1/2 W.
C5	30P093	Cap. Molded Paper, .0068MFD@600V	R20	29M1042	Resistor, 100K, 1/2 W.
C6	30P199	Cap. Ceramic, 20000MMF@500V.	R21	29M1022	Resistor, 1K, 1/2 W.
C7	30P210	Cap. Ceramic, 200MMF@500V.	R22	29M3922	Resistor, 3. 9K, 1/2 W.
C8	30P146	Cap. Ceramic, 270MMF@500V.	R23	29M1542	Resistor, 150K, 1/2 W.
C9	30P180	Cap. Ceramic, 100MMF@500V.	R24	29M5632	Resistor, 56K, 1/2 W.
C10	30P209	Cap. Ceramic, 10000MMF@500V.	R25	29M4742	Resistor, 470K, 1/2 W.
C11	30P042	Cap. Paper, .05MFD@400V.	R26	29M2713	Resistor, 270Ω, 1W.
C12	30P052	Cap. Paper, .02MFD@400V.	R27	29M2281	Resistor, 2. 2Ω, 2 W.
C13	30P203	Cap. Ceramic, 5000MMF@500V.	R28	29M1052	Resistor, 1Meg, 1/2 W.
C14	30P042	Cap. Paper, .05MFD@400V.	R29	29M3342	Resistor, 330K, 1/2 W.
C15	30P207	Cap. Trimmer, 3-30MMF	R30	29M3332	Resistor, 330K, 1/2 W.
C16	30P146	Cap. Ceramic, 270MMF@500V.	R31	29M1506	Resistor, 15Ω, 1/2 W.
C17	30P042	Cap. Paper, .05MFD@400V.	R32	29M1042	Resistor, 100K, 1/2 W.
C18	30P042	Cap. Paper, .05MFD@400V.	R33	29M1042	Resistor, 100K, 1/2 W.
C19	30P146	Cap. Ceramic, 270MMF@500V.	R34	29P064	Resistor, 1K, 3W.
C20	30P154	Cap. Molded Paper, .047MFD@400V.	T1	68P027	Power Transformer
R1	31P087	Volume Control, 250K, 1/2 W.	T2	68P038	Output Transformer
R2	31P086	Tone Control, 500K, 1/2 W.	L1	65P102	Osc. Coil
R3	31P091	Neon Overload Ind. Adj., 1Meg., 1/2 W	SP1	76P036	Speaker 5 x 7 Oval PM
R4	31P091	Neon Normal Ind. Adj., 1Meg, 1/2 W.	M1	32P101	Selector Switch
R5	31P090	Hum Control 500Ω, 1/2 W.	M2	53P017	Neon Overload Ind. NE51
R6	29M4752	Resistor, 4. 7Meg, 1/2 W.	M3	53P017	Neon Normal Ind. NE51
R7	29M5622	Resistor, 5. 6K, 1/2 W.	M4	32P095	Equalizing Switch
R8	29M1542	Resistor, 150K, 1/2 W.	M5	53P030	Pilot Lamp #47

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	42X353	Reel Spindle	18	25P036	Washer
2	45P1794	Plate Cover	19	26P1376	Screw, Rd. Hd. M-40 x 3/16
3	25P361	Washer	20		Washer
4	25P644	Washer	21	11X1222	Shoe and Magnet
5	39P114	Volume Control Knob	22	46P376	Tension Spring
6	49P216-1	On-Off Control	23	45P1752	Magnet Carriage
7	39P114	Tone Control Knob	24	25P036	Washer
8	49P216-2	Monitor Knob	25	46P369	Tension Spring
9	11X1220	Speed Selector Knob	26	11X1162	Bell Crank and Hub Asm.
10	49P220	Head Cover	27	25P584	"C" Washer
11	49P221	Escutcheon	28	11X1166	Pressure Arm and Pad Asm.
12	41P1351	Capstan Shaft	29	46P252	Tension Spring
13	42P354	Fast Speed Knob	30	26P747	Mounting Screw 8-32 x 1/4
14	26P1367	Hex. Nut 8-32	31		Base Plate Assembly
15	41P1357	Tape Guide	32	46P380	Spring, Editing Lever
16	45P1766	Tape Guide Support	33	11X1210	Edit Lever
17	26P1367	Hex. Nut 8-32	34	26B1365	Head Screw

MECHANICAL PARTS LIST-Con't

Ref. No.	Part No.	Description
35		Washer
36	11X1224	Record Head
37	45P1846	Tape Guide
38	25P535	"C" Washer
39	25PP622	Washer Shim (1 to 3)
40	45P1856	Pressure Pad and Bracket
41	11X1212	Roller Arm and Pin Asm.
42	11X1169	Lever, Spring and Pin Asm.
43	46P368	Tension Spring
44	46P416	Tension Spring
45	11X1211	Pivot and Washer Asm.
46	11X1151	Pressure Roller
47	25P620	"C" Washer
48	11X1181	Push Button Assembly
49	46P374	Actuator Spring
50	46P364	Stop Spring (3)
51	49P214-1	Record Key
52	49P214-2	Stop Key
53	49P214-3	Play Key
54		Safety Lever (Part of 48)
55		Safety Release Spring
56	46P012	Spring, Compression
57		Washer
58	46P362	Spring, Reel Spindle Compression
59	45P1784	Clutch Yoke
60	41P1334	Coupling Tube
61	26P629	Set Screw, Bristol 8-32 x 1/4
62		Belt Guide
63		Washer
64		"C" Washer
65	45P1779	Switch Arm
66	11X1152	Capstan Fly Wheel
67	25P643	Washer
68		Spring
69	11X1366	Clutch Pulley
70	23P019	Clutch Disc
71	11X1183	Clutch Pulley and Bearing
72	72P001	Small Drive Belt
73	11X1205	Bearing Disc and Hub Asm.
74		Washer
75	41P1348	Bushing, Clutch
76	11X1173	Brake Drum Asm.
77	46P354	Tension Spring
78	41P1348	Bushing, Clutch
79	26P1349	Stop Nut 10-32
80	11X1176	Motor Mounting Plate Assy.
81	11X1194	Raising Lever and Stud Asm.
82	41P1367	Shift Rod and Pin Asm.
83	46P381	Tension Spring, Shift Rod
84	45P1785	Shift Plate
85	25P306	Lock Washer
86	26P194	Screw Rd. Hd. M. 6-32 x 3/16
87		"C" Washer
88		Washer
89		Lever
90	25P551	Grommet, Motor Mounting
91	23P020	Felt Washer, Motor Shift Plate

Ref. No.	Part No.	Description
92	26P747	Mounting Screw 8-32 x 1/4
93	15X188	Motor Assembly
94	11X1171	Motor Shift Plate and Stud Asm.
95	23P020	Felt Washer
96	25P396	Washer
97	23P020	Felt Washer
98	25P396	Washer
99		Washer
100	25P535	"C" Washer
101	45P1181	Fan Blade
102		Bracket (Part of 103)
103	17X509	Adjusting Screw and Bracket Asm.
104	26P1070	Bracket Mounting Screw (2)
105	41P589	Thrust Bearing Screw
106	26P077	Nut
107	46P371	Spring, Shift Plate Tension
108	26P028	Hex. Nut (2)
109	45P1896	Switch Actuator
110	46P367	Tension Spring
112	11X1196	Play Slide Assembly
113	46P370	Tension Spring
114	26P819	Bristol Set Screw 6-32 x 3/16 (2)
115	11X1204	Lever and Hub Asm.
116	45P1755	Motor Shift Arm
117	46P395	Spring, Actuator Tension
118		Tension Spring
119	25P643	Washer
120	11X1180	Brake Lever and Pad
121	45P1756	Cam Follower
122		Washer
123	26P676	Set Screw 8-32 x 3/16
124	11X1195	Pulley, Cam and Idler Link Asm.
125		Washer
126	42P348	Capstan Casting
127	45P1754	Idler Cam
128	46P356	Torsion Spring
129	25P643	Washer
130	25P584	"C" Washer
131		Pressure Spring
132		Screw
133	25P474	"C" Washer
134	46P379	Idler Retracting Spring
135	11X1172	Rewind Idler Arm and Pivot
136	11X1187	Actuator, Record Listen Asm.
137	25P643	Washer
138	11X1168	Pulley and Bearing Asm.
139	25P643	Washer
140	25P584	"C" Washer
141	46P395	Spring, Actuator Tension
142	72P002	Large Drive Belt
143		Idler Link (Part of Item 124)
144	46P389	Torsion Spring
145	50P359	Retaining Ring
146	26P079	Screw Rd. Hd. M. 6-32 1/2
147	46P391	Tension Spring
148	11X1158	Brake Band and Pad Asm.
149	26P676	Set Screw
150	11X1174	Drum and Hub Asm.